AMENDMENTS TO THE CLAIMS

Claim 1 (Currently amended): A method of imaging *in vivo* expression of a gene in a brain cell of a vertebrate, said method comprising:

i) administering to said vertebrate an imaging reagent comprising a detectable label attached to a first nucleic acid that specifically hybridizes to a second nucleic acid transcribed from said gene, where said first nucleic acid is linked to a targeting ligand that binds a receptor on a cell ~~comprising~~ composing the blood brain barrier of said vertebrate, whereby said composition ~~and~~ crosses said blood brain barrier and enters a brain cell and said first nucleic acid specifically hybridizes to said second nucleic acid; and

ii) detecting the presence or quantity of a signal produced by said detectable label in said brain cell where the presence or quantity of said label indicates the presence or quantity of ~~a~~ said nucleic acid transcribed from said gene ~~or cDNA~~.

Claim 2 (Original): The method of claim 1, wherein said first nucleic acid is a peptide nucleic acid (PNA).

Claim 3 (Currently amended): The method of claim 1, wherein said targeting ligand is selected from the group consisting of an antibody that specifically binds to a receptor on a cell ~~comprising~~ composing the blood brain barrier, and a substrate specifically bound by a receptor on a cell comprising the blood brain barrier.

Claim 4 (Original): The method of claim 3, wherein said targeting ligand is selected from the group consisting of insulin, transferrin, insulin-like growth factor I (IGF-I), insulin-like growth factor II (IGF-II), basic albumin, leptin, and prolactin.

5 (Original): The method of claim 3, wherein said targeting ligand is an antibody that specifically binds to a receptor selected from the group consisting of an insulin receptor, a transferrin receptor, an insulin-like growth factor I (IGF-IR) receptor, and insulin-like growth factor II receptor (IGF-IIR), and a leptin receptor.

6 (Original): The method of claim 1, wherein said first nucleic acid is linked to said targeting ligand by a linker or by an affinity tag.

Claim 7 (Original): The method of claim 1, wherein said first nucleic acid is linked to said targeting ligand by an affinity tag comprising a biotin and a molecule that binds to biotin.

Claim 8 (Original): The method of claim 7, wherein said molecule that binds to biotin is selected from the group consisting of an avidin, a streptavidin, and an anti-biotin antibody.

Claim 9 (Original): The method of claim 7, wherein said first nucleic acid is a peptide nucleic acid.

Claim 10 (Original): The method of claim 9, wherein the carboxyl terminal of said first nucleic acid is amidated.

Claim 11 (Original): The method of claim 7, wherein said first nucleic acid is an antisense peptide nucleic acid.

Claim 12 (Original): The method of claim 7, wherein said first nucleic acid bears a protecting group.

Claim 13 (Original): The method of claim 7, wherein said first nucleic acid is a peptide nucleic acid having an amidated carboxyl terminal.

Claim 14 (Original): The method of claim 1, wherein said detectable label is selected from the group consisting of an radioactive label, a magnetic label, a spin label, an enzymatic label, a colorimetric label, and a fluorescent label.

Claim 15 (Currently amended): The method of claim 1, wherein said <u>first</u> nucleic acid is labeled with a radiolabeled amino acid.

Claim 16 (Original): The method of claim 15, wherein said radiolabeled amino acid is a tyrosine labeled with ^{125}I.

Claim 17 (Original): The method of claim 15, wherein said radiolabeled amino acid is a lysine labeled with 111-indium.

Claim 18 (Original): The method of claim 1, wherein said gene is a gene that encodes a molecule selected from the group consisting of a receptor, and enzyme, a structural protein, and a transcription factor.

Claim 19 (Original): The method of claim 1, wherein:

said first nucleic acid is a peptide nucleic acid;

said targeting ligand is an antibody that specifically binds to a receptor on a cell comprising the blood-brain barrier; and

said first nucleic acid is attached to said targeting ligand through an affinity tag.

Claim 20 (Original): The method of claim 19, wherein said antibody is a monoclonal antibody.

Claim 21 (Original): The method of claim 20, wherein said imaging reagent comprises a radioactive label or a magnetic label.

Claim 22 (Original): The method of claim 21, wherein said first nucleic acid is labeled with a radiolabeled amino acid.

Claim 23 (Original): The method of claim 21, wherein said affinity tag is an affinity tag comprising a biotin.

Claim 24 (Original): The method of claim 23, wherein said antibody is a monoclonal antibody.

Claim 25 (Original): The method of claim 23, wherein said receptor is selected from the group consisting of a transferin receptor and an insulin receptor.

Claim 26 (Original): The method of claim 25, wherein said receptor is a transferrin receptor.

Claim 27 (Original): The method of claim 26, wherein the carboxyl terminal of said first nucleic acid is amidated.

Claim 28 (Currently amended): The method of claim 1, wherein said ~~contacting comprising~~ administering comprises systemically administering said imaging reagent to a living organism.

Claim 29 (Original): The method of claim 28, wherein said organism is a mammal.

Claim 30 (Original): The method of claim 28, wherein said organism is a non-human mammal.

Claim 31 (Original): The method of claim 28, wherein said organism is a human.

Claim Claims 32-61 (Canceled).